

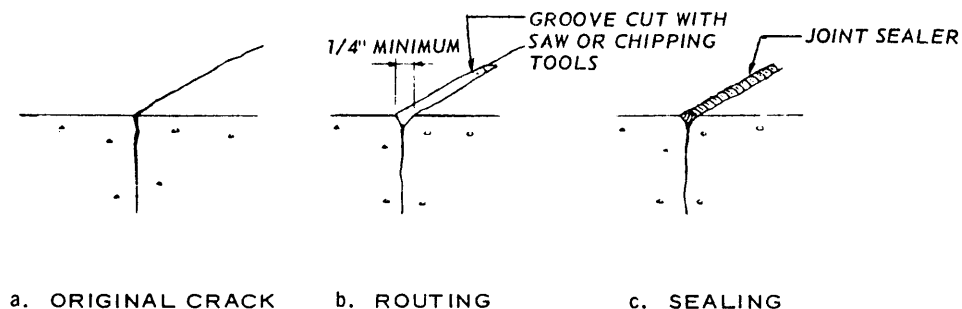


## REMR TECHNICAL NOTE CS-MR-3.2

### CRACK REPAIR METHOD: ROUTING AND SEALING

**PURPOSE:** To provide guidance on use of routing and sealing to repair cracks in concrete. (NOTE: Before selecting any method for repair of cracks, REMR Technical Note CS-MR-3.1, "Selection of a Crack Repair Method," should be reviewed.)

**DESCRIPTION:** This method involves enlarging the crack along its exposed face then filling and sealing it with a suitable material. The routing operation may be omitted but at some sacrifice in the permanence of the repair. This is



the simplest and most common method for sealing cracks and is applicable to sealing both fine pattern cracks and larger isolated cracks.

**EQUIPMENT, TOOLS, AND PERSONNEL REQUIREMENTS:** A concrete saw or other hand or pneumatic tool that can be used to open the crack sufficiently to receive the sealant is required. For large operations, a compressor and air jet nozzle are desirable for cleaning and drying the routed cracks. One man can repair cracks using this method, but a two- or three-man operation is more efficient.

**APPLICATIONS AND LIMITATIONS:** This method can be used on cracks that are dormant and of no structural significance. It is applicable to sealing both fine pattern cracks and large isolated cracks. It will not be effective on an active crack or cracks subject to pronounced hydrostatic pressure, except in sealing the pressure face, in which case some reduction in flow can be obtained. There is also the objection that, once the method has been applied, the surface of the sealed crack will be higher than that of the adjacent concrete.

**STEP-BY-STEP PROCEDURE:** The routing operation consists of following along the crack with a concrete saw or other hand or pneumatic tool, opening the crack sufficiently to receive the sealant. A minimum surface width of 1/4 in. is

desirable since smaller openings are difficult to fill. The surfaces of the routed joint should be cleaned and allowed to dry before sealing. (In areas where the routing has opened only one side of the crack, any grease, oil, or other contaminants clinging to the side that is not chipped should be removed.)

The purposes of the sealant are to prevent: water from reaching the reinforcing steel, hydrostatic pressure from developing within the joint, staining of the concrete surface, or moisture problems from developing on the far side of the member.

The sealant may be any of several materials, depending on how tight or permanent a seal is desired. Epoxy compounds are often used, and hot-poured joint sealants work very well when thorough watertightness of the joint is not required and appearance is not important. Urethane sealants, which remain flexible through large temperature variations, have been used successfully in cracks up to 3/4 in. in width and of considerable depth. There are many commercial products, and the manufacturers should be consulted as to the type and grade of sealant most applicable to the specific purpose and condition of exposure. The method of placing depends on the material to be used and should follow the techniques recommended in ACI 504R-77 (Ref c).

- REFERENCES:
- a. Maintenance and repair of concrete and concrete structures. US Army Corps of Engineers, Washington, DC, 1979. Engineer Manual 1110-2-2002.
  - b. Causes, evaluation, and repair of cracks. ACI Committee 224. In: Journal of the American Concrete Institute, Vol 81, No. 3, American Concrete Institute, Detroit, MI, 1984. ACI 2241.R-84.
  - c. Guide to joint sealants for concrete structures. ACI Committee 504. In: ACI Manual of Concrete Practice, Part 5, American Concrete Institute, Detroit, MI, 1983. ACI 504R-77.